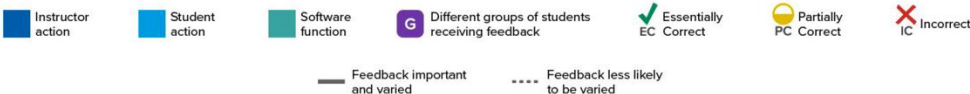
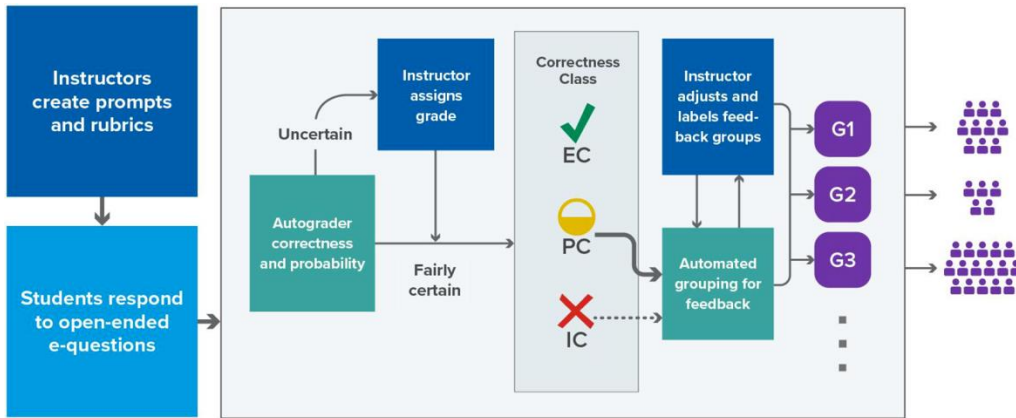


## Progress toward NLP-assisted formative assessment feedback

- "write-to-learn" tasks improve learning outcomes, yet constructed-response methods become unwieldy when class sizes are large
- Logistical obstacles impair pedagogical best practices
- Investigating NLP tools with human-in-the-loop architecture to facilitate scalability—improve student benefit while mitigating instructor burden




- Schematic: Q >> A >> evaluate >> cluster >> feedback
- Recent (Susan Lloyd): Classification performance & HIL policy
- Ongoing (Elle Tang): Implications of language diversity
- Future: Evaluate competing methods of feedback; assess effectiveness, student engagement, scalability, etc

### Related Papers & Acknowledgement:

> Li, Z., Susan Lloyd, Beckman, & Passonneau (2023). Answer-state Recurrent Relational Network (AsRRN) for Constructed Response Assessment and Feedback Grouping. *Findings of the Conference on Empirical Methods in Natural Language Processing (EMNLP) 2023*

> Susan Lloyd, Beckman, Pearl, Passonneau, Li, & Wang (2022). Foundations for AI-Assisted Formative Assessment Feedback for Short-Answer Tasks in Large-Enrollment Classes. In *Proceedings of the eleventh international conference on teaching statistics*. Rosario, Argentina.

 NSF Award #2236150 (Project CLASSIFIES)

## Matthew Beckman

### Statistics & Data Science Education (SDSE) Research



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## Other Projects/Interests

### • Educational Assessment

Developing & analyzing tools to measure specific learning outcomes. Novel approaches to assessment.

"Tests" for research across academic institutions;

Formative assessment; e.g., feedback for self-regulated learning and/or adaptive instruction

> Sayali Phadke, Beckman, Lock Morgan (in review). Measuring contextualized statistical literacy: Evidence from an isomorphic assessment.

### • Data Science Education

Intersection of stat education & computing education

Studying DS/CS topics introduced as learning objectives in statistics curricula

Data literacy, data acumen, EDA for Data Science

> Alyssa Hu, Hatfield, Beckman (in review). Exploring How Novices and Experts Engage in Computational Thinking with Data.

> Beckman et al (2021). Implementing Version Control With Git and GitHub as a Learning Objective in Statistics and Data Science Courses. *JSDSE*, 29(1).

## Curious about SDSE?

- SDSE Research Lab
- Conferences: JSM; USCOTS 2025
- IASE catalog of PhD dissertations
- [causeweb.org](https://causeweb.org)
- Talk to me!